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## Robust hash functions for digital watermarking

Fridrich, J. Goljan, M.

Center for Intelligent Syst., State Univ. of New York, Binghamton, NY;

*This paper appears in: Information Technology: Coding and Computing, 2000. Proceedings. International Conference on*

Meeting Date: 03/27/2000 -03/29/2000

Publication Date: 2000

Location: Las Vegas, NV , USA

On page(s): 178-183

References Cited: 15

IEEE Catalog Number: PR00540

Number of Pages: xvi+528

**Abstract:**

Digital watermarks have been proposed for authentication of both video data and still images and for integrity verification of visual multimedia. In such applications, the watermark has to depend on a secret key and on the original image. It is important that the dependence on the key be sensitive, while the dependence on the image be continuous (robust). Both requirements can be satisfied using special image digest functions that return the same bit-string for a whole class of images derived from an original image using common processing operations. It is further required that two completely different images produce completely different bit-strings. We discuss methods how such robust hash functions can be built. We also show how the hash bits has another application, the robust image digest can be used as a search index for an efficient image database search

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**1 The use of watermarks in the protection of digital multimedia products**

*Voyatzis, G.; Pitas, I.;*

Proceedings of the IEEE , Volume: 87 , Issue: 7 , July 1999

Pages:1197 - 1207

[\[Abstract\]](#)   [\[PDF Full-Text \(324 KB\)\]](#)   IEEE JNL

**2 Rights protection for digital contents redistribution over the Internet**

*Cheung, S.C.; Curreem, H.;*

Computer Software and Applications Conference, 2002. COMPSAC 2002.

Proceedings. 26th Annual International , 26-29 Aug. 2002

Pages:105 - 110

[\[Abstract\]](#)   [\[PDF Full-Text \(434 KB\)\]](#)   IEEE CNF

**3 Content protection and usage control for digital music**

*Changsheng Xu; Yongwei Zhu; Feng, D.D.;*

Web Delivering of Music, 2001. Proceedings. First International Conference on , 23-24 Nov. 2001

Pages:43 - 50

[\[Abstract\]](#)   [\[PDF Full-Text \(279 KB\)\]](#)   IEEE CNF

**4 Advances in digital video content protection**

*Lin, E.I.; Eskicioglu, A.M.; Lagendijk, R.L.; Delp, E.J.;*

Proceedings of the IEEE , Volume: 93 , Issue: 1 , Jan. 2005

Pages:171 - 183

[\[Abstract\]](#)   [\[PDF Full-Text \(680 KB\)\]](#)   IEEE JNL

**5 Transform permuted watermarking for copyright protection of digital video**

*Johnson, A.; Biggar, M.;*

Global Telecommunications Conference, 1998. GLOBECOM 98. The Bridge to Global

Integration. IEEE , Volume: 2 , 8-12 Nov. 1998  
Pages:684 - 689 vol.2

[\[Abstract\]](#) [\[PDF Full-Text \(320 KB\)\]](#) IEEE CNF

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**6 A new watermarking method of digital audio content for copyright protection**

*Ye Wang;*

Signal Processing Proceedings, 1998. ICSP '98. 1998 Fourth International Conference on , Volume: 2 , 12-16 Oct. 1998  
Pages:1420 - 1423 vol.2

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**7 Resistance of digital watermarks to collusive attacks**

*Kilian, J.; Leighton, F.T.; Matheson, L.R.; Shamoon, T.G.; Tarjan, R.E.; Zane, F.;*  
Information Theory, 1998. Proceedings. 1998 IEEE International Symposium on , 16-21 Aug. 1998  
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**8 Image-adaptive watermarking using visual models**

*Podilchuk, C.I.; Wenjun Zeng;*

Selected Areas in Communications, IEEE Journal on , Volume: 16 , Issue: 4 , May 1998  
Pages:525 - 539

[\[Abstract\]](#) [\[PDF Full-Text \(444 KB\)\]](#) IEEE JNL

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**9 Use of cryptographic technologies for privacy protection of watermarks in Internet retails of digital contents**

*Changjie Wang; Ho-fung Leung; Cheung, S.C.; Yumin Wang;*

Advanced Information Networking and Applications, 2004. AINA 2004. 18th International Conference on , Volume: 1 , 2004  
Pages:414 - 419 Vol.1

[\[Abstract\]](#) [\[PDF Full-Text \(285 KB\)\]](#) IEEE CNF

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**10 Optimizing watermarking to improve the robustness without affecting the fidelity**

*Kamijo, K.;*

Information Technology: Coding and Computing, 2001. Proceedings. International Conference on , 2-4 April 2001  
Pages:95 - 102

[\[Abstract\]](#) [\[PDF Full-Text \(460 KB\)\]](#) IEEE CNF

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**11 Content-based digital signature for motion pictures authentication and content-fragile watermarking**

*Dittmann, J.; Steinmetz, A.; Steinmetz, R.;*

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**12 A buyer-seller watermarking protocol***Memon, N.; Ping Wah Wong;*

Multimedia Signal Processing, 1998 IEEE Second Workshop on , 7-9 Dec. 1998

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[\[Abstract\]](#) [\[PDF Full-Text \(328 KB\)\]](#) IEEE CNF**13 Data hiding for fighting piracy***Barni, M.; Bartolini, F.;*

Signal Processing Magazine, IEEE , Volume: 21 , Issue: 2 , Mar 2004

Pages:28 - 39

[\[Abstract\]](#) [\[PDF Full-Text \(714 KB\)\]](#) IEEE JNL**14 Digital watermarks: Shedding light on the invisible***Yeung, M.M.; Boon-Lock Yeo; Holliman, M.;*

Micro, IEEE , Volume: 18 , Issue: 6 , Nov.-Dec. 1998

Pages:32 - 41

[\[Abstract\]](#) [\[PDF Full-Text \(308 KB\)\]](#) IEEE JNL**15 A wavelet-based watermarking for digital images and video***Ejima, M.; Miyazaki, A.;*

Image Processing, 2000. Proceedings. 2000 International Conference on , Volume:

3 , 10-13 Sept. 2000

Pages:678 - 681 vol.3

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